Search Forms
Search Results
Help
User Searches
Preferences   181 of 257   File: USPT   Nov 26, 1996
Logout

DOCUMENT-IDENTIFIER: US 5579447 A
TITLE: System for developing and displaying a representation of a total estimated
time to print a job

Abstract Text (1):
There is provided an apparatus for developing and displaying a representation of a
total estimated time to print a job. The apparatus includes a user interface, with
a display screen, for selectively programming the job with plural print related
attributes, wherein selected ones of the print related attributes affecting a time
required to print the job. The apparatus further includes a memory for storing the
image data and the print related attributes as well as a processor for generating
an estimated time to print value for each of the plural electronic pages based on
the selected attributes programmed during said programming which affect the time
required to print the job, the estimated time to print generating being performed
prior to printing the job. In operation, the processor sums the values generated
with the estimated time to print generating for obtaining a total estimated time to
print, wherein the representation of the total estimated time to print is displayed
on the display screen.

Brief Summary Text (1):
The present invention relates generally to a technique for a printing system which
stores a previously captured job and prints the same on demand and, more
particularly, to an apparatus and method of developing and displaying a
representation of a total estimated time to print the job.

Brief Summary Text (8):
Systems exist for indicating the extent to which a job has been printed. For
example, the following patent is related to a method for displaying an estimated
time remaining to print a job:

Brief Summary Text (12):
As disclosed in U.S. Pat. No. 5,036,361 an estimated time to complete a job can be
displayed on the screen of a user interface. Moreover, a graphic representation is
provided on a screen during the printing of a job to indicate the extent to which
the job has been printed. The printing machine of the U.S. Pat. No. 5,036,361 is a
"light-lens" copier in which captured image data is delivered directly to a print
engine from the source of image capture. These sorts of copiers are unable to
determine the amount of time required to perform post capture operations, such as
image processing related operations. Moreover, these sorts of copiers do not employ
compression/decompression techniques, so the time associated with such operations
cannot be estimated therewith. While the approach of U.S. Pat. No. 5,036,361 is
well suited for uncompressed jobs in which post capture operations are not
required, there is no way such copier can accurately estimate time to job
completion for a job requiring any more than scanning and marking. Indeed, it is
believed that only printing machines capable of storing and evaluating a job, with
its attendant attributes, can accurately access an estimate of corresponding print
time for each type of job. It would be desirable to provide a technique in which a
printing system user, prior to marking, is able to determine, with a relatively
high degree of accuracy, an estimate of print time for a previously captured job.

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Brief Summary Text (13):
In accordance with the present invention, there is provided an apparatus for developing and displaying a representation of a total estimated time to produce prints corresponding with a print job, the print job comprising plural electronic pages with image data and the apparatus including: a user interface, with a display screen, for selectively programming the job with plural print related attributes, wherein selected ones of the print related attributes affect a time required to print the job; a memory for storing the image data and the print related attributes; a processor for generating an estimated time to print value for each of the plural electronic pages based on the selected attributes programmed during said programming which affect the time required to print the job, said estimated time to print generating being performed prior to printing the job; and said processor summing the values generated with said estimated time to print generating for obtaining the total estimated time to print, wherein the representation of the total estimated time to print is displayed on said display screen.

Detailed Description Text (30):
Referring to FIGS. 6-9, a technique for obtaining and displaying a time required to print a given job, i.e., for obtaining and displaying the Job ETC, is discussed. As soon as a nominal amount of information for a job is made available to the printing subsystem 100, an ETC database, as illustrated in FIG. 9, is, via step 128, constructed. As shown in FIG. 9, each page is mapped with one or more images and each image is associated with an ETC. Actually, the ETC database can even be constructed as soon as a nominal amount of job programming information is provided. More particularly, available information is communicated to the job manager 110 (FIG. 6) and the available data is processed, by the job manager, with the following criteria:

Detailed Description Text (52):
The printing system 10 is capable of storing multiple print jobs, by way of a print queue. More particularly, referring to FIGS. 2 and 10, information regarding each stored, print-ready job, is preferably stored in a heap memory 164, the heap memory comprising suitable nonvolatile memory coupled with the VBus 28 by way of a suitable heap memory control 166. Further details regarding queue systems suitable for use in a digital printing systems may be obtained by reference to U.S. Pat. No. 5,206,735. Referring specifically to FIG. 10, an exemplary queue maintained in heap memory is shown. In practice the queue, which includes at least two types of information, namely the Job ETC for each stored, print ready job and a cumulative time, i.e., a "System ETC", required to print the stored, print ready jobs, is displayed, via step 168, 170, on the screen associated with the UI 114. It will be appreciated that these times would be adjusted appropriately in accordance with job interrupts of the type discussed in U.S. Pat. No. 5,206,735.

Detailed Description Text (59):
Finally, the technique of the disclosed embodiment permits the user to obtain information about his/her job relative to other print jobs stored on the associated printing system. More particularly, in the preferred embodiment, the user is provided with a display showing each queued job with its corresponding estimated time to compile printing. Moreover, the cumulative times of the queued jobs are provided so that the user knows not only how long his/her job should take to print, but at what future moment his/her job will start printing.

CLAIMS:

1. In a printing system for producing prints from a job comprising plural electronic pages with image data, an apparatus for developing and displaying a representation of a total estimated time to print the job, comprising:

a user interface, with a display screen, for selectively programming the job with

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plural _print_ related attributes, wherein selected ones of the _print_ related attributes affect a _time_ required to _print_ the job;

a memory for storing the image data and the print related attributes;

a processor for generating an estimated time to print value for each of the plural electronic pages based on the selected attributes programmed during said programming which affect the time required to print the job, said estimated time to print generating being performed prior to printing the job; and

said processor summing the values generated with said estimated _time to print_ generating for obtaining the total estimated _time to print,_ wherein the representation of the total estimated _time to print is displayed on said display_ screen.

8. The apparatus of claim 1, in which the selective programming of the job is represented on the display screen, wherein:

the selective job programming is changed in response to the _displayed_ total estimated _time to print;_ and

said estimated _time to print_ generating, said summing and said _displaying_ are performed for the changed selective job programming.

10. A method for developing and _displaying_ a representation of a total estimated _time to print_ a job in a _printing_ system, the _printing_ system having a memory, a _display_ screen and a _print_ engine, the job comprising plural electronic pages with image data, comprising:

selectively programming the job with plural print related attributes, wherein selected ones of the print related attributes affect a time required to print the job;

storing the image data and the print related attributes in the memory;

prior to printing the job, generating an estimated time to print value for each of the plural electronic pages based on the selected attributes programmed during said programming which affect the time required to print the job; and

summing the values generated in said estimated time to print generating for obtaining the total estimated time to print; and   .

displaying the representation of the total estimated _time to print on the display_ screen.

13. The method of claim 12, further comprising _displaying_ the updated total estimated _time to print_ representation.

17. The method of claim 10, in which the _printing_ system includes a first _print_ engine with a first set of operating properties and a second _print_ engine with a second set of properties, the estimated _time to print_ value varies as a function of _print_ engine operating properties, and the first set of _print_ engine operating properties is different than the second set of _print_ engine operating properties, wherein said method includes performing said estimated _time_ generating, said summing and said _displaying_ for each of the first set of _print_ engine operating properties and the second set of _print_ engine operating properties, and further comprising selecting one of the first and second _print_ engines for _printing_ the job on the basis of performing said estimated _time to print_ generating, said summing and said _displaying_ for each of the first set of _print_ engine operating properties and the second set of _print_ engine operating properties.

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. 18: The method of claim 10, in which the selective programming of the job is represented on the display screen, further comprising:

changing the selective job programming in response to the <u>displayed</u> total estimated <u>time to print</u>; and

performing said estimated <u>time to print</u> generating, said summing and said <u>displaying</u> for the changed selective job programming.

21. The method of claim 20, further comprising <u>displaying</u> the updated total estimated <u>time to print</u> representation.

23. A method for developing and <u>displaying</u> a first representation of a total estimated <u>time to print</u> a first job in a first <u>printing</u> system and a second job in a second <u>printing printing</u> system, each of the first and second <u>printing</u> systems having a memory, a <u>display</u> screen and a <u>print</u> engine, each of the first and second jobs comprising plural electronic pages with image data, comprising:

a) selectively programming one of the first and second jobs with plural print related attributes, including selected ones of the print related attributes affecting a time required to print the one of the first and second jobs;

b) storing both the image data and the print related attributes for the one of the and second jobs in the memory;

c) prior to printing the one of the first and second jobs, generating an estimated time to print value for each of the plural electronic pages of the one of the first and second jobs based on the selected attributes programmed with said programming which affect the time required to print the one of the first and second jobs; and

d) summing the values generated in said step c) for obtaining the total estimated time to print the one of the first and second jobs;

e) repeating a)-d) for the other one of the first and second jobs; and

f) <u>displaying</u> the first representation of the total estimated <u>time to print</u> the first job and the second representation of the total estimated <u>time to print</u> the second job on the <u>display</u> screen.

24. The method of claim 23, further comprising:

a) summing the total estimated time to print the first job and the total estimated time to print the second job to obtain a representation of the total estimated time to print both the first and second jobs; and

b) <u>displaying</u> the representation of the total estimated <u>time to print</u> both the first and second jobs on the <u>display</u> screen.

h   e b   b g ee e f   e c

Search Forms
Search Results
Help
User Searches
Preferences
Logout

Entry 219 of 257   File: USPT   Jul 30, 1991

DOCUMENT-IDENTIFIER: US 5036361 A
TITLE: Job requirements calculation and display

Abstract Text (1):
A method of providing a prominent time of completion display and percentage of
completion display for a given job requirement and providing an indication of the
amount of paper stock required from several sources of paper stock in a printing
system including the steps of responding to entered job requirements to calculate a
total time of completion for the given job and the paper stock required from each
of the paper stock sources, displaying the total time of completion at the operator
interface, displaying the amount of paper stock required from each of the paper
stock sources, and initiating the job run and during the job run periodically
determining the time to completion of the remaining portion of the job and
displaying the time to completion in a prominent bar graph.

Brief Summary Text (2):
The invention relates to a system for controlling reproduction machines such as
copiers and printers, and more particularly, to methods and apparatus for
calculating and displaying job requirements such as job completion time and paper
requirements.

Brief Summary Text (3):
As reproduction machines such as copiers and printers become more complex and
versatile in the jobs they can do, the user interface between the machine and the
operator or user, which in essence permits the dialogue between operator and
machine, must necessarily be expanded if full and efficient utilization of the
machine is to be realized. This is particularly important in a reproduction center
or multi-machine environment where an operator is always concerned about the
availability of machine time as well as the requirements for supplies such as copy
sheets.

Brief Summary Text (7):
U.S. Pat. No. 4,627,715 top Kikuno discloses a product monitoring system for a
copier that determines if there is sufficient paper to complete a programmed job
based on the size of the job. A warning signal is produced if the paper supply is
insufficient.

Brief Summary Text (15):
Briefly, the present invention is concerned with the method of providing a
prominent time of completion and percentage of completion display for a given job
requirement and providing an indication of the amount of copy stock required from
several sources of paper stock in a printing system including the steps of
responding to entered job requirements to calculate a total time of completion for
the given job and the paper stock required from each of the paper stock sources,
displaying the total time of completion at an operator interface, displaying the
total number of paper stock required from each of the paper stock sources, and
initiating the job run and during the job run concurrently determining the time to
completion of the remaining portion of the job and displaying the percentage in a
prominent bar graph.

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CLAIMS:

1. In a <u>printing</u> system having a machine with a plurality of operating components, a control with operator interface and <u>display</u> for entering job requirements, the control cooperating with the operating components to produce images on copy sheets, and a plurality of sources of copy sheets, the method of providing the <u>time</u> of completion for a given job requirement and providing an indication of the number of copy sheets required from each source of copy sheets including the steps of:

calculating the number of documents in a document set and the number of sets required,

determining whether or not the job is in progress,

graphically displaying the percentage completion of the job, and

calculating the requirements for each of the copy sheet sources, and

displaying the number of sheets required from each of the sources.

6. In a <u>printing</u> system having a machine with a plurality of operating components and a control with operator interface and <u>display</u> for entering job requirements, the control cooperating with the operating components to produce images on copy sheets, the method of providing the <u>time</u> of completion for a given job requirement including the steps of:

responding to the entered job requirements for a first job run to calculate a total time of completion for the first job run.

displaying the total time of completion at the operator interface,

initiating the first job run and during the first job run determining the time to completion of a second job run.

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